Amendments to the Specification

Please amend paragraph 40 as follows:

[0040] Furthermore, the general I/O mapping may be determined by a first principles model based on the basic physical properties of the process. Examples of such first principles modeling systems are provided by assignee Aspen Technology, Inc. of Cambridge, Mass. and are described in commonly assigned U.S. patent applications Ser. No. 09/678,724, entitled "Computer Method and Apparatus for Determining State of Physical Properties in a Chemical Process," now U.S. Patent No. 6,862,562 to Treiber *et al.* issued on March 1, 2005, and U.S. patent application Ser. No. 09/730,466, now U.S. Patent No. 6,654,649 to Treiber *et al.* issued on November 25, 2003, entitled "Computer Method and Apparatus for Optimized Controller in a Non-Linear Process," both of which are incorporated herein by reference.

Please amend paragraph 155 as follows:

[0155] If the inputs to the model 44 described in equation (16) are state vectors from for example a state space model, then the overall steady state gains between the actual model inputs and the output can be constrained by including the steady state contribution of each state variable to the output (for that particular input) as a linear set of weighting factors in equations (18) and (19). Examples of such state space models are provided by assignee Aspen Technology, Inc. of Cambridge, Mass. and are described in commonly assigned U.S. patent application Ser. No. 09/160,128, now U.S. Patent No. 6,453,308 to Zhao *et al.* issued on September 17, 2002 and filed Sep. 24, 1998, entitled "Non-linear Dynamic Predictive Device," and U.S. Pat. No. 5,477,444, issued Dec. 19, 1995, entitled "Control System Using an Adaptive Neural Network for a Target and Path Optimization for a Mulitvariate, Nonlinear Process", both of which are incorporated herein by reference.